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Evaluation of a Tool to Predict 90-day Readmission or Death Following Hospitalization for COPD

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BACKGROUND

COPD exacerbations are one of the most common reasons for hospital admission with approximately one-third of patients requiring readmission within 90 days^{1,2}. At the University of California San Francisco Medical Center, a study found that clinicians have difficulty identifying patients at high risk for readmission. In a comparison between provider groups, no group accurately predicted who would be readmitted³. Several predictive models exist for COPD; however, they were developed primarily to determine risk of death (ADO⁴ and BODEX⁵) or health status (DOSE⁶) rather than hospital readmission. PEARL was developed as a predictive tool for 90-day readmissions or death in patients discharged following an admission for an acute exacerbation of COPD⁷.

An effective predictive tool for identifying patients at high risk for readmission or death within 90 days would allow clinicians to target high risk patients with early interventions. Early interventions may translate into better overall patient health and better use of limited healthcare resources⁸.

PURPOSE

The PEARL (Previous admissions, Extended Medical Research Council Dyspnoea Scale (eMRCd), Age, Right-sided heart failure, Left-sided heart failure) tool has previously been validated to predict 90-day readmission or death after admission for a COPD exacerbation using the extended Medical Research Council Dyspnoea (eMRCd) score. The purpose of this study is to evaluate the predictive ability PEARL replacing the eMRCd with the modified Medical Research Council (mMRC) dyspnoea scale. SAMMC uses mMRC rather than eMRCd as a validated measure of dyspnea⁹ which is the dyspnea score used with PEARL. It is unknown if the PEARL tool modified with mMRC still provides predictive value.

METHODS

- This retrospective cohort study will use San Antonio Military Medical Center (SAMMC) admission data for the 18 month period from 1 Jan 2016 to 30 Jun 2017.
- The target population is adults over 18 years of age with a diagnosis of COPD who have received care one of the medical center facilities.
- The study has been approved by the Institutional Review Board.
- An electronic medical record *ad hoc* report will identify patients admitted with a primary diagnosis of acute exacerbation of COPD.
- The following data will include the PEARL indices, demographic data, and outcomes data.
- A modified PEARL score will be calculated using mMRC scores of 0, 1, 2, and 3 (replacing eMRCd scores of 1, 2, 3, and 4 respectively); mMRC scores of 4 will be assessed as eMRCd 5a in one calculation and as 5b in a second calculation.
- Chi-square will be used to compare PEARL risk assignment (low, intermediate, or high) with the combined endpoint of readmission or death without readmission at both 90 days and at 30 days.
- Imputation will be used to handle missing data.

PEARL indices	eMRCd	mMRC
Previous admissions	1 - Breathless with strenuous exercise	0 - Breathless with strenuous exercise
eMRCd	2 - Breathless when hurrying on level or walking up slight hill 3 - Walks slower than peers or stops walking at own pace	1 - Breathless when hurrying on level or walking up slight hill 2 - Walks slower than peers or stops walking at own pace
Age	4 - Stops after 100m or for a few minutes on level	3 - Stops after 100m or for a few minutes on level
Right-sided heart failure	Too breathless to leave house and wash/dressing	4 - too breathless to leave house or breathless when dressing/undressing
Left-sided heart failure	5a - independent in washing/dressing 5b - dependent in washing/dressing	

RESULTS

- An admission report was run with data from 1 Jan 2016 through 30 Jun 2017.
- 410 admissions were found to have a primary diagnosis of acute exacerbation of COPD.
- Data is currently being extracted from outpatient and inpatient medical records.

DISCUSSION

Pending results

CONCLUSION

Pending results

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DISCLOSURES

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